

REMARKS/ARGUMENTS

Claims 1-14 and 28-29 are pending. Reconsideration is respectfully requested.

1. Rejection of Claims 1-2, 4-8 and 28 Under § 103(a)

Claims 1-2, 4-8 and 28 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,420,753 (Hoang) in view of US Patent 5,021,848 (Chiu). The Applicants respectfully traverse this rejection.

Claim 1 recites a memory cell and an MOS transistor formed in the memory area and the peripheral area of the substrate, respectively. The memory cell includes a floating gate and a control gate, and the MOS transistor includes a poly gate. A *continuously formed* insulating layer of material has a first portion disposed between the control gate and the floating gate, and a second portion disposed between the poly gate and the substrate. The first portion has a thickness permitting Fowler-Nordheim tunneling, and the second portion has a thickness greater than that of the first portion.

The Examiner relies on layer 206, along with a portion of layer 202, of Hoang for teaching the claimed first and second portions of the insulating layer of claim 1. The Examiner admits that Hoang fails to show the insulating layer being initially formed as a continuous layer of material, as recited in claim 1. However, the Examiner states that Chiu shows a continuous insulating layer having a first portion disposed between the control gate and the floating gate, and a second portion disposed between the poly gate and the substrate and having a thickness that is greater than that of the first portion. The Examiner concludes it would have been obvious to use the continuous insulating layer of Chiu with the device of Hoang for the purposes of reducing manufacturing cost and materials.

The Applicants respectfully traverse this rejection for several reasons. First, the applications respectfully submit that Chiu does not show a continuous insulating layer as stated by the Examiner. While the Examiner does not identify which layer of material from Chiu is relied upon, apparently layers 21 and 40 are being relied upon for showing the insulating layer having a first portion between the control gate and the floating gate, and a second portion between the poly gate and substrate. However, these two layers are not "*initially formed as a*

continuous layer of material” as recited in claim 1. Instead, Chiu clearly shows that layer 21 is formed before, and separately from, layer 40 (see Col. 10, lines 18-20 and Fig. 9A). Layer 40 is not formed until later in the manufacturing process, as shown by Col. 10, lines 59-63, and Fig. 10A. To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974); MPEP 2143.03. The Applicants respectfully submit that obviousness has not been established, since neither Hoang or Chiu teach the claimed insulating having its first and second portions *“initially formed as a continuous layer of material.”*

The Applicants also traverse the Examiner’s conclusion that it would have been obvious to use the insulation layer(s) of Chiu with the device of Hoang. Both of these references teach complex semiconductor manufacturing processes, which involve the formation of materials and layers in a specific order to achieve the desired semiconductor structure. It is unclear how the process of Hoang can be modified to form the insulation layer(s) of Chiu, and why one in the art would make such a modification.

Claims 2, 4-8 and 28 all depend on claim 1, and are therefore deemed allowable for the reasons set forth above. Further, Hoang and Chiu fail to teach elements recited in these dependent claims. For example, even if Chiu layers 21 and 40 were somehow incorporated in the Hoang device, the thinner layer portion (i.e. layer 40) does not extend between the substrate and the control gate as recited in claim 8.

It is therefore respectfully submitted that claims 1-2, 4-8 and 28 are not rendered obvious over Hoang in view of Chiu, and that this rejection should be withdrawn.

2. Rejection of Claim 3 Under § 103(a)

Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,429,073 (Furuhata). Claim 3 depends upon claim 1, which is deemed allowable for the reasons set forth above. Applicants respectfully submit that Furuhata fails to cure the deficiencies of Hoang and Chiu.

3. Rejection of Claims 9-14 and 29 Under § 103(a)

Claims 9-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,429,073 (Furuhata), in view of Chiu. It is believed the Examiner meant to state that claims 9-14 and 29 are rejected over Furuata in view of Hoang and Chiu, because the Examiner makes later reference to claim 29, as well as numerous references to Hoang and to the reasons for rejecting claim 1. Furuata is apparently cited merely for teaching a second source and a second drain in a memory device. Therefore, the Applicants assume as such, and respectfully traverse this rejection on that basis.

Claim 9 is similar to claim 1, in that it recites an insulating layer initially formed as a continuous layer of material having a first portion disposed between the control gate and the floating gate, and a second portion disposed between the poly gate and the substrate, where the first portion has a thickness permitting Fowler-Nordheim tunneling and the second portion has a thickness greater than the first portion. As stated above in Part 1, neither Hoang or Chiu teach such an insulating layer. Moreover, Furuata clearly fails to cure this deficiency. Thus, it is submitted that claim 9 is not rendered obvious over Hoang, Chiu and/or Furuata.


Claims 10-14 and 29 all depend on claim 9, and are therefore deemed allowable for the reasons set forth above. Further, Hoang, Chiu and Furuata fail to teach elements recited in these dependent claims. For example, even if Chiu layers 21 and 40 were incorporated in the Hoang device, the thinner layer portion (i.e. layer 40) does not extend between the substrate and the control gate as recited in claim 8.

It is therefore respectfully submitted that claims 9-14 and 29 are not rendered obvious by Hoang, Chiu and/or Furuata, and that this rejection should be withdrawn.

For the foregoing reasons, it is respectfully submitted that the claims are in an allowable form, and action to that end is respectfully requested.

Respectfully submitted,

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